REMARKS

Introduction

The examiner rejected claim 9 as allegedly indefinite, claims 1, 3, and 7-9 as allegedly anticipated by Goto *et al.* (Blood, 84(6): 1922-1930 (1994)) and claims 2, and 4-6 as allegedly obvious over Goto, in view of Kang *et al* (U.S. Patent No. 5,656,448) (claims 2, 4 and 6) or Young *et al.* (U.S. Patent No. 6,335,183) (claim 5).

Status of the Claims

In this amendment, applicants amended claim 9 to more clearly define the present invention and added new claim 13. Support for the amended and new claims can be found in original claim 9. Upon entry of this amendment, claims 1-9 and 13 will be under examination.

35 U.S.C. § 112, second paragraph

The examiner rejected claim 9 as allegedly indefinite, asserting that there is insufficient antecedent basis for "the primary antibody or the second antibody." Applicants therefore amended claim 9 to depend on claim 8. Accordingly, the indefiniteness rejection is rendered moot.

35 U.S.C. § 102

The examiner rejected claims 1, 3, and 7-9 as allegedly not novel in view of Goto *et al.* Specifically, the examiner asserted that Goto teach an immunoprecipitation assay using an anti-HM1.24 monoclonal antibody that reacts with a soluble HM1.24 antigen. Applicants respectfully assert that Goto do not anticipate the present invention.

The instant invention is directed to an immunochemical assay for anti-HM1.24 antibody using a **soluble** HM1.24 antigen and an immunochemical assay for a **soluble** HM1.24 antigen protein. Goto do not described the use of a **soluble** HM1.24 antigen protein.

Prior to the present invention, it was believed that HM1.24 is a typical type II membrane protein and therefore, can be solubilized by deletion of an N-terminal region including a transmembrane region, while maintaining the C-terminal extracellular region. However, the present inventors found that deletion of an N-terminal region including a transmembrane domain does not produce a soluble HM1.24 antigen protein. Surprisingly, deletion of an N-terminal region, including the transmembrane domain and part of the C-terminal protein region, yields a soluble HM1.24 antigen protein. See, for example, specification at page 51, lines 2-27. The invention explains that Figure 7 indicates that cells to which mouse anti-HM1.24 antibody and anti-HM1.24 antibody were added, the peak fluorescence intensity shifts to the right compared to the control, indicating that the mouse anti-HM1.24 antibody and anti-HM1.24 antibody were bound to the HA tagged soluble antigen producing CHO cells. This confirms that the HM1.24 antigen and hemagluttin tagged peptide are expressed at high levels on the cell surface. Thus, because the HM1.24 antigen is expressed on the cell surface, it is not soluble.

On the other hand, page 54 of the specification, teaches that "since HM1.24 antigen has a hydrophobic region of about 14 amino acids in the C-terminal end, it was thought that part of the expressed antigen will remain on the surface instead of being secreted into the culture supernatant" (specification at 54, lines 5-9). "By deleting the hydrophobic region of the C-terminal end, HA-tagged soluble antigen that had been trapped, came to be secreted into the culture supernatant" (specification at 59, lines 5-9).

As such, deletion of only an N-terminal portion including a transmembrane region does not produce a soluble HM1.24 antigen protein, while deletion of an N-terminal region including a transmembrane region and a part of the C-terminal region provided a soluble HM1.24 protein. This finding is not anticipated by Goto and Goto do not detect or determine levels of soluble HM1.24 antigen. Thus, the present rejection is moot.

35 U.S.C. § 103

The examiner rejected claims 2, 4 and 6 as allegedly obvious over Goto in view of Kang. In particular, the examiner stated it would have been obvious to have employed a solid

support (beads or plates) taught by Kang, in the assay methods taught by Goto, for the convenience of contacting antigen-antibody reactions in a sample (see, office action at 4). "[S]uch solid supports are considered well known and conventional in the immunoassay art" (*id.*).

In addition, the examiner rejected claim 5 as allegedly obvious over Goto, in view of Young. Specifically, the examiner stated that Young teach "[a] stress protein joined to fusion proteins to enhance the immune response" (office action at 5).

However, in view of the arguments set forth above with regard to the Goto publication, the examiner has failed to establish a *prima facie* case of obviousness. In order to establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references when combined) must teach or suggest all the claim limitations. See MPEP 2142. As Goto, in view of Kang or Young do not teach or suggest all the claim limitations, e.g., a soluble HM1.24 antigen, applicants respectfully assert that the obviousness rejection is improper.

CONCLUSION

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and arguments.

It is respectfully urged that the present application is now in condition for allowance. Early notice to that effect is earnestly solicited.

The examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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